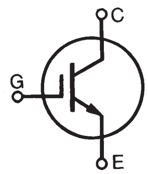
IXYS

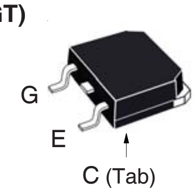
High Voltage IGBT

IXGT6N170
IXGH6N170

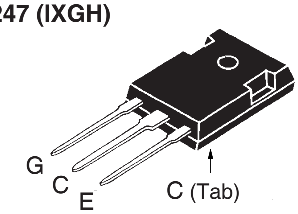
V_{CES} = 1700V
I_{C90} = 6A
$V_{CE(sat)}$ ≤ 4.0V
$t_{fi(typ)}$ = 290ns



TO-268 (IXGT)



TO-247 (IXGH)



G = Gate C = Collector
E = Emitter Tab = Collector

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_C = 25°C to 150°C	1700	V
V_{CGR}	T_J = 25°C to 150°C, R_{GE} = 1MΩ	1700	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	T_C = 25°C	12	A
I_{C90}	T_C = 90°C	6	A
I_{CM}	T_C = 25°C, 1ms	24	A
SSOA (RBSOA)	V_{GE} = 15V, T_{VJ} = 125°C, R_G = 33Ω Clamped Inductive Load	I_{CM} = 12 @ 0.8 • V_{CES}	A
P_C	T_C = 25°C	75	W
T_J		- 55 ... +150	°C
T_{JM}		150	°C
T_{stg}		- 55 ... +150	°C
T_L	Maximum Lead Temperature for Soldering	300	°C
T_{SOLD}	1.6 mm (0.062in.) from Case for 10s	260	°C
M_d	Mounting Torque (TO-247)	1.13/10	Nm/lb.in.
Weight	TO-268	4	g
	TO-247	6	g

Features

- International Standard Packages
- High VoltagePackage

Advantages

- High Power Density
- Low Gate Drive Requirement

Applications

- Capacitor Discharge & Pulse Circuits
- Uninterruptible Power Supplies (UPS)
- Motor Drives
- DC Servo & Robot Drives
- DC Choppers
- Switched-Mode & Resonant-Mode Power Supplies

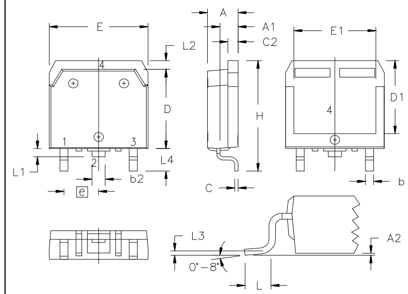
Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{CES}	I_C = 250μA, V_{GE} = 0V	1700			V
$V_{GE(th)}$	I_C = 250μA, V_{CE} = V_{GE}	3.0		5.0	V
I_{CES}	V_{CE} = 0.8 • V_{CES}, V_{GE} = 0V			10	μA
	T_J = 125°C			100	μA
I_{GES}	V_{CE} = 0V, V_{GE} = ± 20V			±100	nA
$V_{CE(sat)}$	I_C = I_{C90}, V_{GE} = 15V, Note 1		3.0	4.0	V
	T_J = 125°C		4.0		

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	I_C = 6A, V_{CE} = 10V, Note 1	3.0	4.5		S
$I_{C(ON)}$	V_{GE} = 15V, V_{CE} = 10V		28		A
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		330		pF
C_{oes}			23		pF
C_{res}			6		pF
Q_g	I_C = 6A, V_{GE} = 15V, V_{CE} = 0.5 • V_{CES}		20.0		nC
Q_{ge}			3.6		nC
Q_{gc}			8.0		nC
$t_{d(on)}$	**Inductive load, T_J = 25°C**		40		ns
t_{ri}	I_C = 6A, V_{GE} = 15V		36		ns
$t_{d(off)}$	V_{CE} = 0.8 • V_{CES}, R_G = 33Ω		250	500	ns
t_{fi}	Note 2		290	500	ns
E_{off}			1.5	2.5	mJ
$t_{d(on)}$	**Inductive load, T_J = 125°C**		45		ns
t_{ri}	I_C = 6A, V_{GE} = 15V		40		ns
E_{on}	V_{CE} = 0.8 • V_{CES}, R_G = 33Ω		0.5		mJ
$t_{d(off)}$	Note 2		300		ns
t_{fi}			300		ns
E_{off}			2.0		mJ
R_{thJC}				1.65	°C/W
R_{thCK}	TO-247		0.21		°C/W

Notes:

1. Pulse test, t ≤ 300μs, duty cycle, d ≤ 2%.
2. Switching times & energy losses may increase for higher V_{CE}(clamp), T_J or R_G.

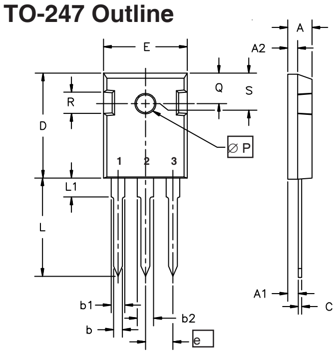
TO-268 Outline



Terminals: 1 - Gate 2,4 - Collector
3 - Emitter

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.193	.201	4.90	5.10
A1	.106	.114	2.70	2.90
A2	.001	.010	0.02	0.25
b	.045	.057	1.15	1.45
b2	.075	.083	1.90	2.10
C	.016	.026	0.40	0.65
C2	.057	.063	1.45	1.60
D	.543	.551	13.80	14.00
D1	.488	.500	12.40	12.70
E	.624	.632	15.85	16.05
E1	.524	.535	13.30	13.60
e	.215 BSC		5.45 BSC	
H	.736	.752	18.70	19.10
L	.094	.106	2.40	2.70
L1	.047	.055	1.20	1.40
L2	.039	.045	1.00	1.15
L3	.010 BSC		0.25 BSC	
L4	.150	.161	3.80	4.10

TO-247 Outline



Terminals: 1 - Gate 2 - Collector
3 - Emitter

Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches Max.
A	4.7	5.3	.185	.209
A_1	2.2	2.54	.087	.102
A_2	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b_1	1.65	2.13	.065	.084
b_2	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L1		4.50		.177
∅P	3.55	3.65	.140	.144
Q	5.89	6.40	0.232	0.252
R	4.32	5.49	.170	.216
S	6.15 BSC		242 BSC	

Fig. 1. Output Characteristics @ T_J = 25ºC

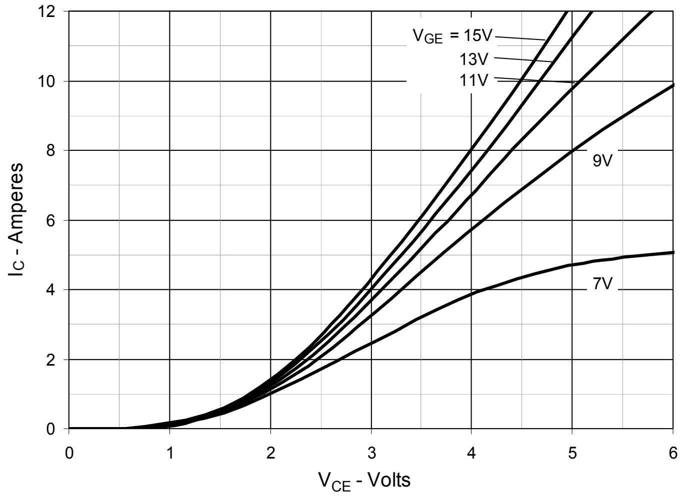


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

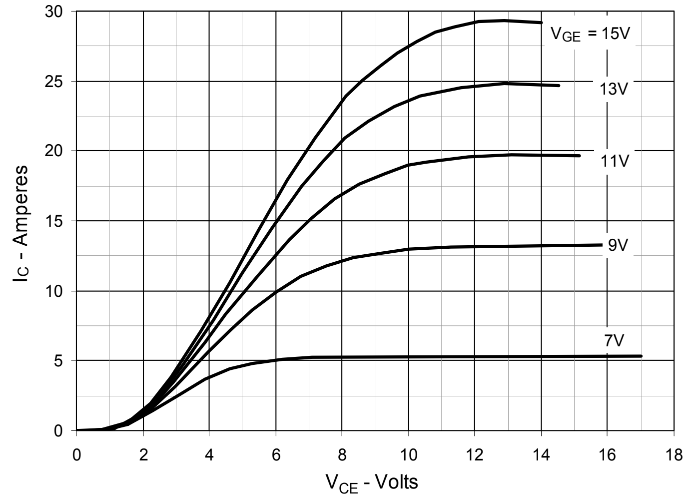


Fig. 3. Output Characteristics @ T_J = 125ºC

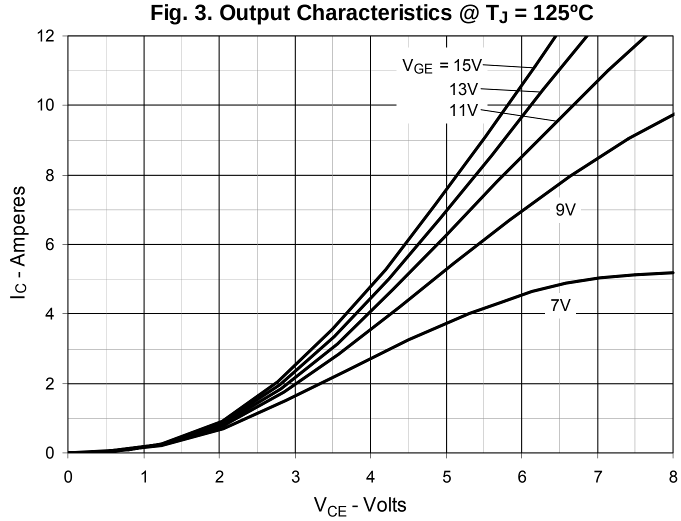


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

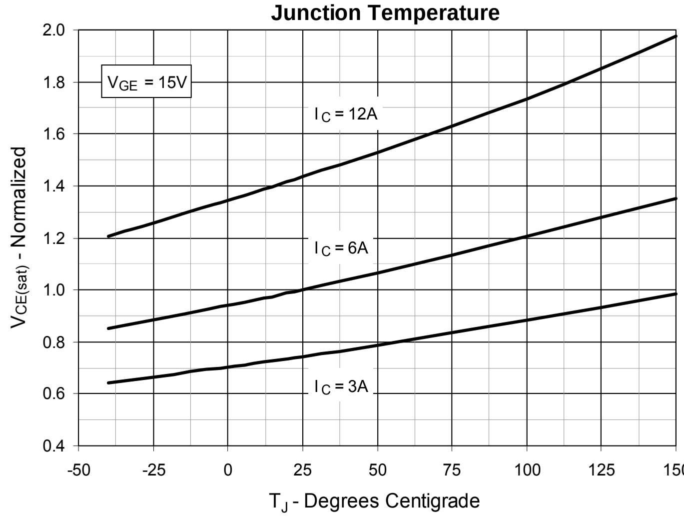


Fig. 5. Input Admittance

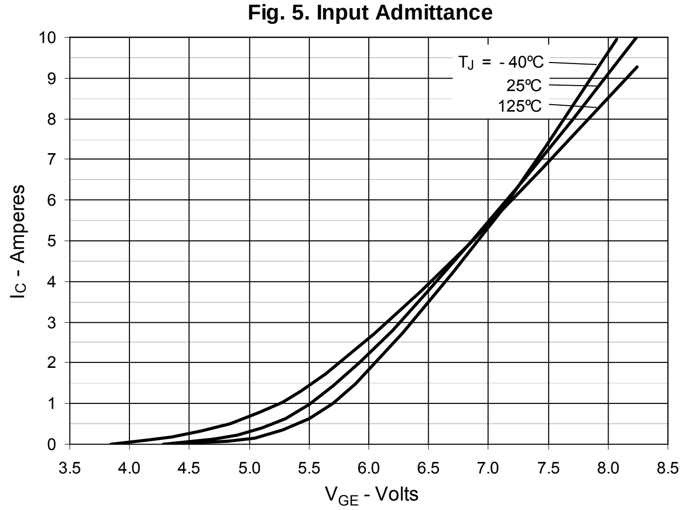
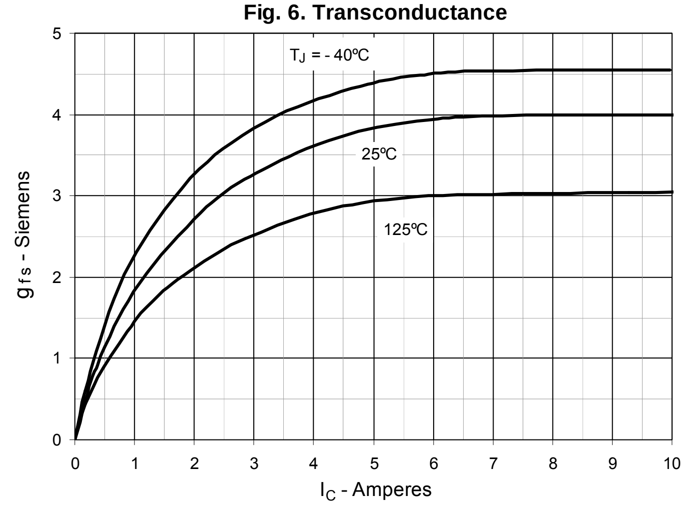
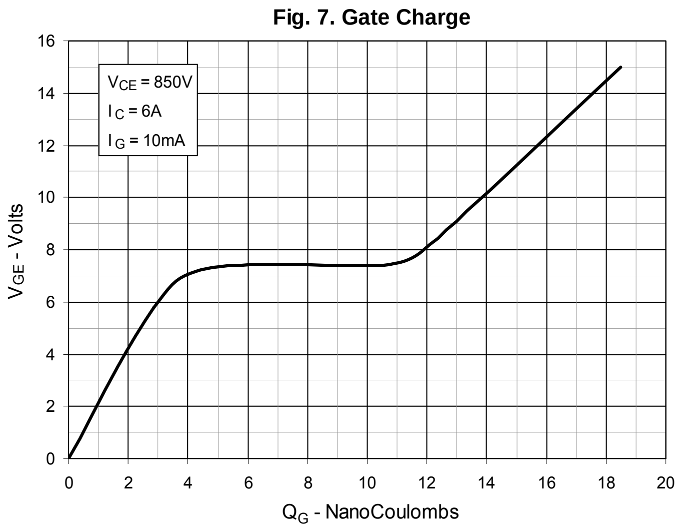
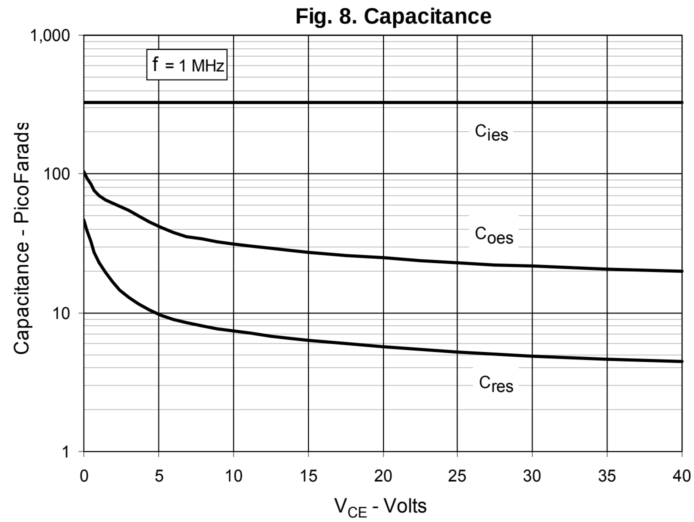
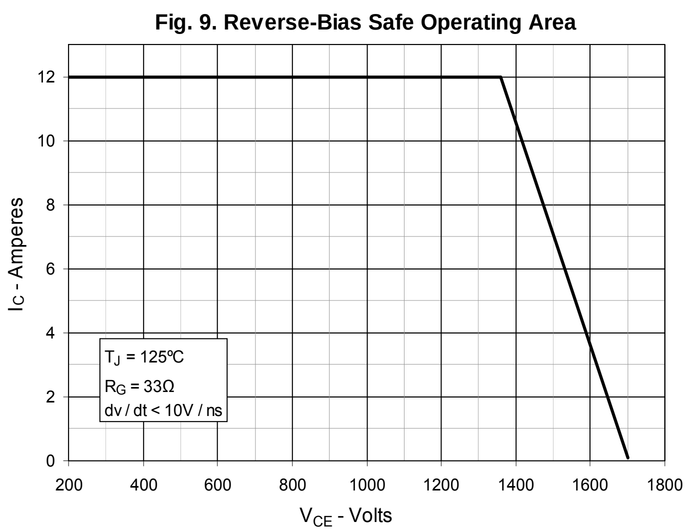


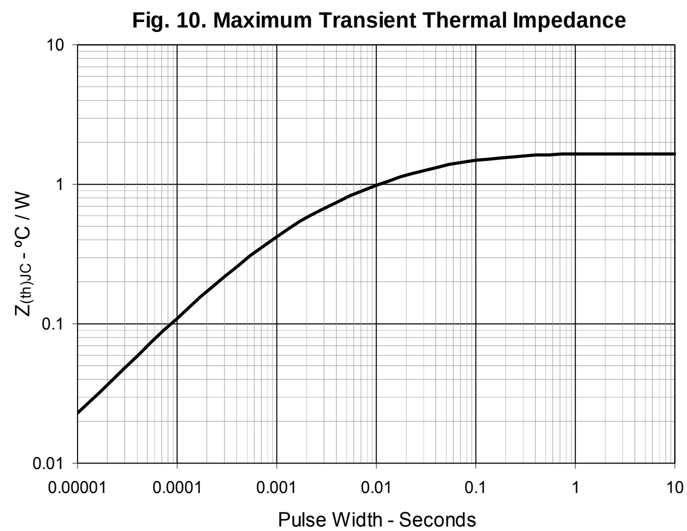
Fig. 6. Transconductance

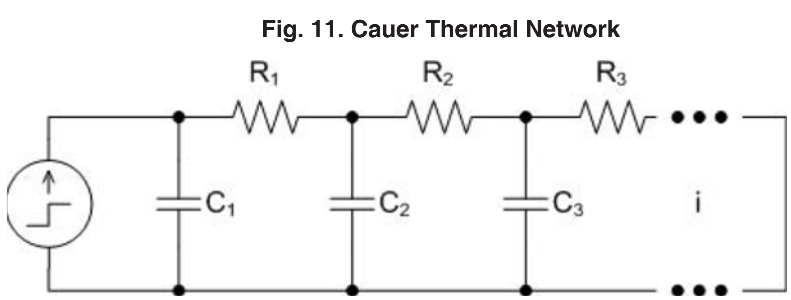












i	Ri (°C/W)	Ci (J/°C)
1	0.11615	0.0019257
2	0.29930	0.0016574
3	0.26377	0.0262960